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FIELD PANTOGRAPH
[Feldpantograph]

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Claims

1. Field pantograph with an extender which consists of a number of legs connected to each other as a type of Nuremberg scissors (scissor-like link) by means of joints with legs located in a plane and seated so as to rotate about a standing axis having on its free end a moving pen with a drawing plate located next to the standing axis and extending in a plane orthogonal to the standing axis, said plate being equipped with a drawing apparatus equipped with a drawing pen which is actuated together with the extender, characterized in that the legs (20) of the extender (10) are located in a plane parallel to the standing axis (12) and the extender (10) in this plane is articulated so as to pivot up and down to the standing axis (12), and that the drawing apparatus (14) is controlled by means of a rod (12) located parallel to the standing axis (12), on which a casing (16) articulated to the extender (10) can be guided up and down.

2. Field pantograph according to Claim 1, characterized by a parallel guide linkage (26) which is composed of rods articulated to each other and connected to the legs (20) of the extender (10) and running parallel to said extender, and which can rotate on its one end around the standing axis (12) and whose other end is articulated to the driving pin (24).

3. Field pantograph according to Claim 1, characterized in that the drawing apparatus (14) is equipped with a drawing parallelogram (28) which extends above and in the plane of the drawing plate, and pivots with the extender (10) around the standing axis (12).

4. Field pantograph according to Claim 3, characterized in that the drawing apparatus is furthermore equipped with a frame supporting the standing axis (12) in an upper plate (30) and forming the support for the drawing plate in a lower plate (32), whereby the controlling parallelogram (34) is located above the upper plate (30) and the drawing parallelogram (28) is located underneath the upper plate (30), and the controlling parallelogram (34) and the drawing parallelogram (28) are connected to each other by

means of casings concentric to the standing axis (12) in such a manner that the drawing parallelogram (28) mimics the movements of the controlling parallelogram (34).

Description

The invention pertains to a field pantograph according to the upper clause of Claim 1, like that known from DE-GM 74 27 705.

Field pantographs of this kind are used for drawing terrain characteristics on a reduced scale, as used in particular for documentation of archaeological excavations.

The known field pantograph is not suitable if the terrain characteristics to be recorded are not located in a plane, but have differences in elevation.

The invention is based on the problem of creating a field pantograph with an extender designed with a scissors-like link which can also be used for applications having a difference in elevation.

According to the invention, this problem is solved by the properties stated in the characterizing portion of Claim 1. The dependent claims describe preferred embodiments.

One design embodiment of the invention will be explained in greater detail based on the figures. We have:

Figure 1 is a schematic, side view of the invented field pantograph,

Figure 2 is a design embodiment with a parallel control linkage, and

Figure 3 is a schematic illustration of the drawing parallelogram.

The field pantograph consists of an extender 10, which consists of a number of legs 20. This field pantograph can rotate around these legs on a standing axis 12 and can pivot up and down relative to it. At the free end of the extender 10 there is a driving pin 24 which pivots in the plane of the extender 10.

In addition, there is a rod 18 securely attached to a controlling parallelogram 34 of the drawing apparatus 14 seated on and rotating at the base of the standing axis 12 by means of casings 36, 38 with the extender 10 rotating around it in a plane orthogonal to the plane of the extender 10, whereby a casing 16 articulated to the extender 10 can move up and down on the rod 18. The controlling parallelogram 34 is connected, by means of the casings 36, 38 concentric to the standing axis 12, to a similarly constructed drawing parallelogram 28 which bears a drawing pen 40. This drawing pen acts on a drawing plate which is formed by the lower plate 32 of a frame whose upper plate 30 supports the standing axis.

Furthermore, in the design embodiment shown in Figure 2 there is a parallel control linkage 26 composed of rods connected to each other and articulated with the legs 20 of the extender 10 and said rods run parallel to the extender, said parallel linkage being able to rotate on its one end around the standing axis 12 and being articulated on its other end with the driving pin 24. This parallel control linkage ensures that the driving pin 24 will always be aligned precisely parallel to the standing axis regardless of the particular slope of the extender with respect to the standing axis.

The extender 10 which is articulated to the standing axis 12 in a plane parallel to the standing axis 12, can pivot up and down in this plane. The driving pin 24 and with it, the extender 10, can thus be controlled to mimic the particular soil elevations and soil depressions. The casing 16 which can rotate on the articulation of the extender 10 neighboring the standing axis 12, can be moved freely up and down on the rod 18 which, in turn, is secured to the controlling parallelogram 34. Therefore, it is assured that the controlling parallelogram 34 will track the horizontal movements of the driving pin 24 even when the extender is pivoted up and down.

This movement of the controlling parallelogram 34 is transferred by means of the casings 36, 38 parallel to the standing axis 12 to the drawing parallelogram 28 located underneath the upper plate 30 of

the frame and are transferred to the drawing plate by means of a drawing pen 40 controlled by the drawing parallelogram 28.

The proposed field pantograph makes possible a pivoting of the extender 10 in the plane parallel to the standing axis 12; therefore, the driving pin can follow the differences in elevation of the terrain being recorded. Due to a locking of the rod 18 in the casing 14 articulated to the extender 10, the height of the extender can be established, which will allow the drawing of elevation lines.

Furthermore, a counterweight 42 can be provided on a leg 44 of the extender 10 which protrudes past the standing axis.

The proposed embodiment of the drawing apparatus 14 with a separate controlling parallelogram 34 set onto the standing axis above the upper plate 30 bearing the standing axis, and the transfer of its movements by means of the casings 36 and 38 to the upper plate 30 and to the lower plate 32 forming the drawing plate, will allow a recording of the region surrounding the field pantograph without the standing axis 12 perforating the drawing plate and thus the drawing paper.

It is evident that the proposed field pantograph can also be positioned so that the standing axis 12 and thus the plane of the extender 10 will run horizontally in order to record the profile of vertically positioned terrain relief.

Due to a corresponding embodiment of the drawing parallelogram 28, additional reductions in scale are possible, for example, 1:10 and 1:20.

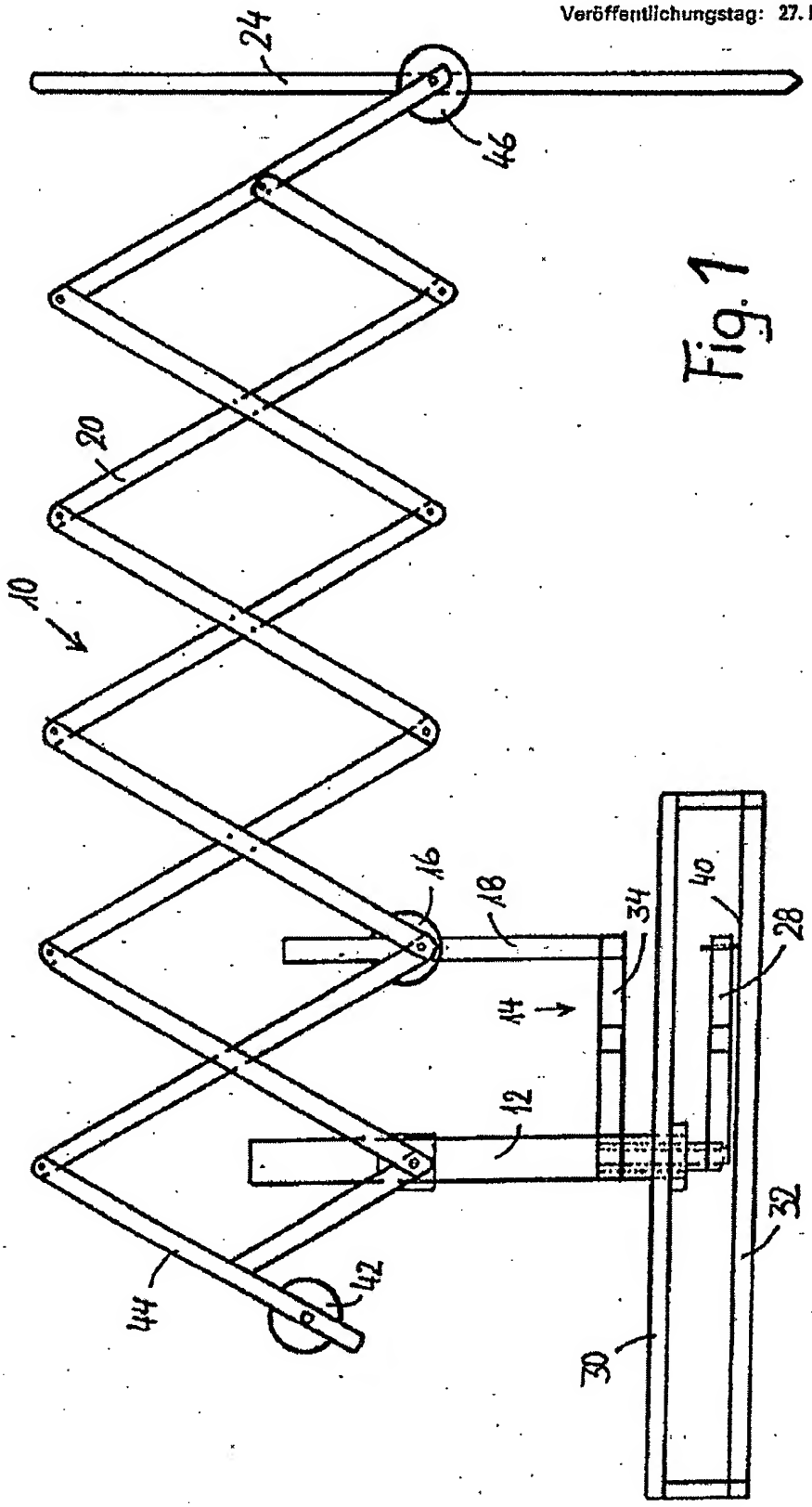

Fig. 1

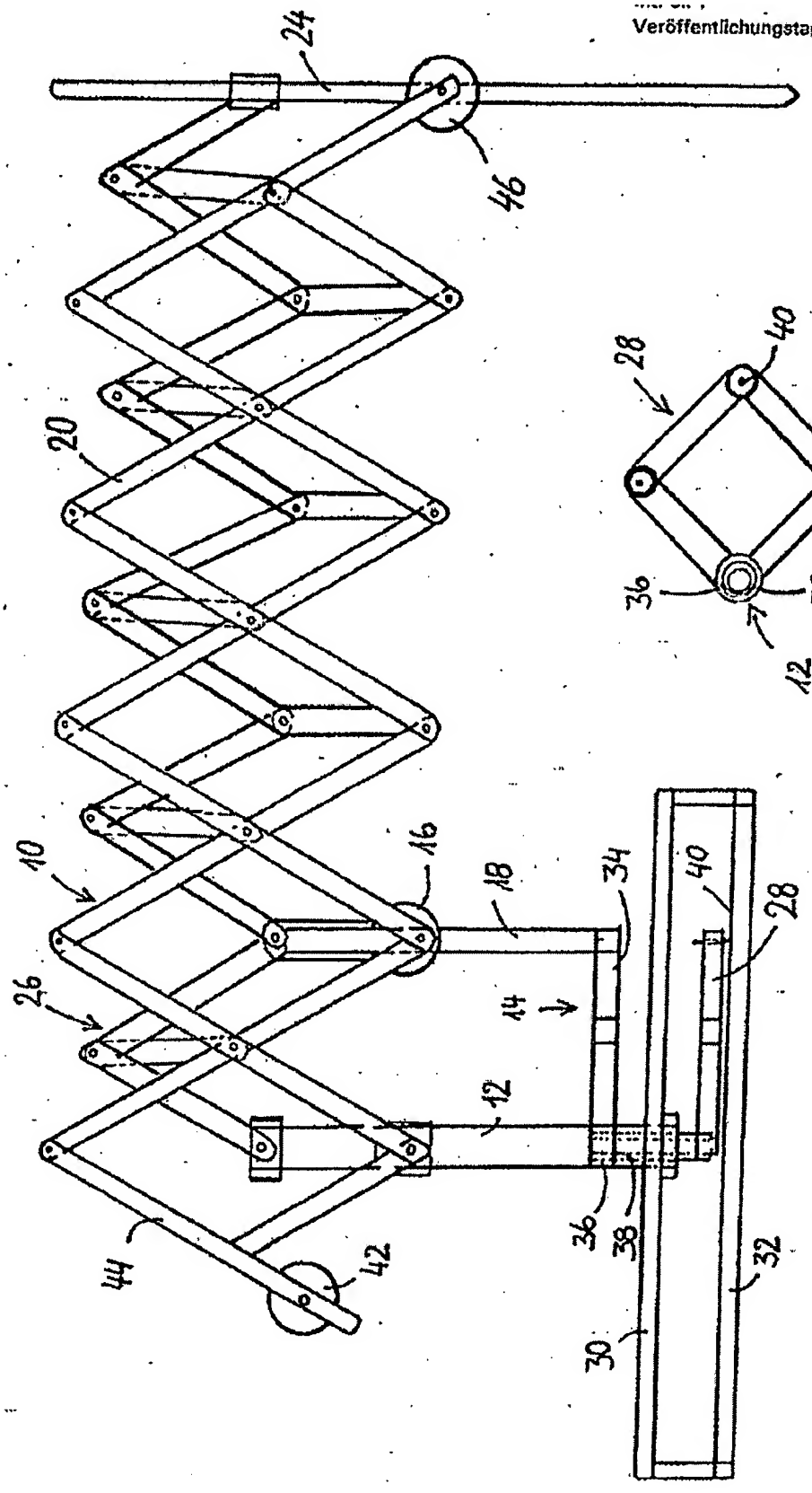

Fig. 2

Fig. 3